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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,270	09/09/2004	Jung-Hoon Shin	5204-052	4870
20575 7590 12/20/2006 MARGER JOHNSON & MCCOLLOM, P.C. 210 SW MORRISON STREET, SUITE 400 PORTLAND, OR 97204			EXAMINER BOLDA, ERIC L	
			ART UNIT 3663	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/20/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/507,270

Applicant(s)

SHIN ET AL.

Examiner

Eric Boldt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to Applicant's amendment of Nov. 27, 2006.

Response to Arguments

2. Applicant's arguments filed Nov. 27, 2006 have been fully considered but they are not persuasive.
3. With regard to claim 1, Applicant argues **A** that Delaveaux illustrate in Figs. 3-4 side-pumping waveguide amplifiers, because this is the terminology used by Delaveaux to describe the waveguide amplifier. (Fig. 2 was not cited in the rejection made in the previous Office Action.) However, it is clear from these Figures that referring to towards the top of the page being upwards and the towards the bottom downwards, the light source is below the gain medium structure, and it pumps the gain medium structure by means of light directed upward. The functionality of the device is not changed by inverting the upwards and downwards directions. Further, Applicant argues that Delaveaux requires an additional waveguide (62) or (72) to enable optical pumping. In response, the Examiner points out that the language of the claims, "a top-pumped optical device *comprising...*" does not exclude the possibility of additional waveguide structures.
4. With regard to claim 2, Applicant argues **B** that Delaveaux does not disclose "a cladding layer that transmits the light irradiated from the pumping light source". This is due to lack of identification of the cladding layers and whether such layers transmit light irradiated from the pumping light source. In response, the Examiner notes that in order

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for Delaveaux's device to function as described, it is inherent that the elements (62) or (72) below and above the gain structure (40) are a cladding of the waveguide (in particular the multimode waveguide (40)). The inner medium(40) of the optical waveguide is generally referred to as the "core" while the outer medium (in this case (62) or (72)) is referred to as the "cladding". See Saleh and Teich, Fundamentals of Photonics, pp. 248.

5. Applicant's arguments with respect to claims 4 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delaveaux (US Pat. No. 6,043,929) in view of Abdelkader (US Pat. No. 5,555,127).

With regard to claim 1, Delaveaux discloses in Fig. 3 or alternatively in Fig. 4, an optical amplifier comprising

- a lower cladding layer,
- a gain medium structure (36),(38),(40),(42), (44) formed on the lower cladding layer, wherein the middle portion (40) of the gain medium overlapping the pump

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beam, has a larger cross-sectional area than the other portions of the gain medium

- an upper layer

The gain medium is excited by absorbing pump light at wavelength λ_p , which is incident from below on the larger area portion (40) of the gain medium. Note that the designation of an “upper” cladding layer and “lower” cladding layer is reversed here with respect to applicant’s terminology because the pump is placed at the bottom; however, the device falls within the scope of the claim as can be seen by turning the figures upside down.

Delaveaux does not specifically disclose that the upper cladding (the one non-adjacent the pump, corresponding to applicant’s lower cladding) is formed on a substrate.

However, Abdelkader teaches (Abstract) that an optical amplifier is fabricated on a single substrate. It would have been obvious to one skilled in the art (e. g. an optical engineer) to mount the optical amplifier of Delaveaux on a substrate as in Abdelkader for the advantage of increased optical stability.

With regard to claim 2 the lower cladding layer transmits the light irradiated from the pumping light source.

With regard to claim 3, the gain medium inherently exhibits amplification (i. e. non-absorption) in the signal wavelength band λ_s , but exhibits great absorption in the pump wavelength band λ_p , in order to maintain population inversion of the excited state.

With regard to claim 7, it is well-known in the art of optical engineering to use an LED as a pumping light source.

With regard to claim 8, the gain medium structure includes adiabatic portions (38) and (42) between the portion with larger area (40) and the other portions (36), (44).

With regard to claim 9, the pumping light source contacts the surface of the cladding layer, to avoid losses due to reflection at the cladding-air interface.

8. Claims 4,6, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delaveaux (US Pat. No. 6,043,929) as applied to claims 1-3 and 7-9 in view of Abdelkader (US Pat. No. 5,555,127), and further in view of Garito (US Pat. App. No. 2003/0234978).

With regard to claims 4 and 10, Delaveaux and Abdelkader disclose all the elements of the claim, except that the gain medium is made of a silica-based substance doped with excited elements and nano-crystals. However, Garito teaches optical waveguide amplifiers (Fig. 2) with a core (32) comprising polymer host matrix doped with excited elements (Er) and nanoparticles. The host matrix may include silica, i. e. be silica based [para. 0069]. It would have been obvious to one skilled in the art (e. g. an optical engineer) to use the optical waveguide of Garito in the optical amplifier of Delaveaux as modified by Abdelkader for the purpose of shortening the length of the gain medium and ease of integration with other optical components [para. 0015].

With regard to claim 6, the optical amplifier produces amplification by means of stimulated emission from rare-earth elements in an excited (pumped) state .

Note that the citations made herein are done so for the convenience of the applicant; they are in no way intended to be limiting. The prior art should be considered in its entirety.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric Bolda whose telephone number is 571-272-8104. The examiner can normally be reached on M-F from 8:30am to 5pm.


If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Jack Keith, can be reached on 571-272-6878. Please note the fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

En

Eric Bolda


JACK KEITH
SUPERVISORY PATENT EXAMINER